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ABSTRACT

The school board establishes a commitment to efficient energy management through its policies and budget priorities. Such a policy should include a statement of purpose, assign accountability for improving energy efficiency, and ensure that mandated standards are maintained. To permanently prevent energy waste, a gradual change to a comprehensive goal-oriented program needs to be made that follows basic changes with major capital improvements, including computer-monitored technology. An example of using technology for increasing energy efficiency is the school system of Mercer County, West Virginia. A computer-controlled heating/ventilating/air conditioning (HVAC) system at one of the high schools was installed by Honeywell Controls with monitoring accomplished by a computer in Atlanta, Georgia. Smaller buildings are under contract with a local firm that has installed energy monitoring devices. The school district also received funding from the Federal Assistance Program for financing paneling, retrofitting, insulation, furnace renovation, and installation of thermostats with night set-backs. A list of the management projects and activities currently implemented or planned in Mercer County is provided along with three sources for additional energy conservation information. (MLF)

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Updating SCHOOL BOARD POLICIES

Volume 16/Number 9/October 1985

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Put the heat on cutting energy costs

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Could your energy program pass a cost/efficiency audit?

Don't count on it unless you already have done some planning and made the right moves.

Valid goal

Most people probably would agree that reducing the cost of heating, cooling, and lighting school facilities while increasing their efficiency is a valid school system goal. Just consider that funds spent on energy might otherwise be spent on the instructional program.

Nevertheless, not every school system has made a commitment to achieving that goal by:

- adopting policy guidelines;
- identifying and committing necessary funds;
- involving staff, students, and parents;
- establishing a cycle for ongoing evaluation.

Many school systems began addressing energy conservation during the energy crisis in the 1970s when fuel was scarce and expensive. But efficient energy use should be part of an ongoing program, not a crisis posture.

Objectives may vary

Whether large or small, school systems can strive toward more efficient energy usage. What may vary among school systems, however, are the objectives for achieving that goal.

For example, saving "x" percent of heating costs for a given year is measurable and could be an objective in your school system. To achieve it, guidelines need to be established. Because all conditions, buildings, and people are different, however, guidelines should provide some flexibility. There will be a difference in savings between two school buildings, for instance, if one is heated electrically and the other is heated with gas.

Some examples of useful guidelines for reducing heating/cooling costs are determining:

- maximum temperatures for heating and cooling, perhaps 68 degrees for heating and 78 degrees for cooling;
- hours during which heating and cooling will be provided, or separate standards for evening hours and daytime hours;
- how energy will be provided for special activities, such as an athletic event that requires only partial use of a building.

Other guidelines should address fiscal support and management. For example, to ensure that your energy program has a chance to operate more efficiently, start-up funds for needed equipment, supplies, and materials *must* be allocated. And energy costs won't stop there. You'll need resources for ongoing maintenance and necessary improvements.

Find out if there is adequate staff to monitor, maintain, and upgrade systems. Does staff need additional training? Are job descriptions accurate? Is staff encouraged to stay up-to-date on what's happening in the energy management field? Do employees subscribe to specialized publications and join professional associations? Does the school system provide staff with leave time (and funding for expenses) to encourage conference attendance? Once you compile this information, decide where changes in policies, regulations, or job descriptions will contribute to improved energy management.

How will you fund essential capital and operating costs? Should guaranteed value return—the recouping of capital outlay costs on equipment in a reasonable time period by saving on operating costs (commonly referred to as "pay back")—be a prerequisite to making capital improvements?

Sometimes energy equipment suppliers agree to be paid with funds accrued through energy cost reductions. They view this as a practical response to the inability of school systems to fund up-front capital costs. Or savings may be sufficient to cover loan costs for lease-purchase arrangements.

Involve users

The entire school community can play an active role in your energy efficiency program. For example, parents will have to make sure that their children are properly dressed for conditions established at school. Notify parents about the school system's commitment to energy efficiency by letting them know:

- how children should dress for school;
- what temperature will be maintained in school buildings;
- where to call for more information.

This information can be disseminated through the school newsletter, local media, or special notices sent home by individual schools or the school system.

School staff should be involved as well by following established daily routines,

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such as closing windows and doors, turning off lights, and monitoring temperatures. In addition, the instructional staff can use the energy efficiency program as a catalyst for teaching students about the need for energy conservation and everyone's part in it. By incorporating energy conservation instruction into the science curriculum or a special project, students gain practical knowledge that they can apply at school, in the community, and at home. Poster and essay contests give students a chance to use and enhance basic skills while raising the consciousness of students, staff, and community to energy conservation.

Some school systems recognize that cooperation of students and staff is a key element in reducing energy waste. Incentives such as awarding a portion of the money saved to the schools that reduce energy costs the most is a common practice. In Philadelphia, for example, the school system gives back to each school for its use 40 percent of the money the school saved the previous year.

Program evolution

To slam the door permanently on energy waste, a gradual change to a comprehensive goal-oriented program needs to be made. Relying on quick fix solutions, such as indiscriminately adjusting temperature controls or performing emergency maintenance, won't provide consistency or long-term benefits.

In addition to the obvious quick fix, steps in the evolutionary process are first to make basic changes, then to follow with major capital improvements, including computer-monitored technology.

Basic change means getting and maintaining buildings in proper shape. Some of the better known basic change solutions to energy waste include construction changes, such as the replacement of deteriorated wooden-frame windows, updating antiquated and inefficient lighting systems, installing drop ceilings, and renovating roofs. For example, florescent or mercury vapor lights are more efficient to operate than incandescent lighting. Also, pastel colors on walls will reduce lighting needs. Even planting trees outside a school building can cut heating costs by reducing wind chill in some instances. Basic change also involves routine preventive maintenance to extend equipment life, reduce downtime, decrease emergency work, and save energy.

The initial costs of these basic changes require some level-headed budgeting. The savings accrued can be measured, however, by monitoring utility bills to show that capital outlay costs will have a pay back in a calculable number of years.

Full-scale program

During the third phase of the evolutionary process, the extensive and long-term reduction of energy unit demands becomes the major thrust. The experience of Mercer County (Princeton, W. Va.) Public Schools, which serves 14,000 students and operates 38 buildings, points to some phase three operations that you might consider.

Mercer County's energy efficiency program was initiated in 1979-80. It now incorporates most of the activities cited in recent literature as resulting in energy conservation (see box). During the last two years, the program has come to full bloom. For proof, here is the hard evidence: From 1983-84 to 1984-85, the increase in utility costs was less than one percent even though utility rate costs increased five percent!

Technology pays off

In addition to some basic strategies, Mercer County uses technology for increasing energy efficiency. Princeton Senior High School went on line with a computer control HVAC (heating/ventilating/air conditioning) system in December 1984. Equipment was installed by Honeywell Controls with monitoring accomplished by computer in Atlanta.

Preliminary checks on the cost/savings indicate that fuel savings are running above the projection: $33,000 over a five-year period. At this rate, the savings will offset the project costs easily and return a profit over time in constant dollars by saving twice the cost of monitoring and telephone line usage. Another large Mercer County building, Bluefield Junior High School, is scheduled to go on line this year.

Smaller buildings are under contract with a local firm that has installed energy monitoring devices. Both Honeywell Controls and the local company provide printed progress reports on the performance of their systems and also calculate and report on the savings.

Princeton and Bluefield are relatively new buildings. They opened in the 1982-83 school year. Honeywell engineers selected those buildings as the two most likely to respond to energy efficiency measures.

Operating schedules reflecting actual school use were developed with Honeywell engineers and scheduled changes are handled by telephone calls to a computer operator. Heating units in certain areas are shut down automatically when not needed. Sensors act as "silent sentries" to provide heating and cooling in correct amounts at the appropriate time.

Another benefit is that equipment life is expected to increase because the contract with Honeywell calls for maintenance of equipment controls when malfunctions are discovered by the Atlanta-based monitor. Also, while computer monitors effectively control energy use, they also provide the means for collecting and reporting data.

Federal assistance

Another important aspect of Mercer County's energy efficiency program is the Federal Assistance Program. Administered in West Virginia by the state Economic and Community Development Office, this program permits school systems to apply for matching funds for paneling, retrofitting, and monitoring heating and cooling units. Applications are made on cycle grants issued periodically to qualifying school systems.

As a prerequisite, a preliminary energy audit must be conducted at each school, but technical assistance grants are available for doing the audits. The preliminary audit identifies what can be done quickly and inexpensively, and provides a baseline.

Mercer County Public Schools ap-

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plied for and received over $300,000 from the federal program; in-kind expenses, consisting mostly of hourly wages for the maintenance crew, and supplies, materials, and equipment, totaled $168,000. The federal funding gave Mercer County the capability to do paneling, retrofitting, insulation, furnace renovation, and installation of thermostats with night set-backs.

During the early years of the multi-year plan, exterior window areas were covered on the upper half (the portion usually covered by blinds) with aluminum faced urethane insulated panels, or replaced with double glazed windows in a sandwich type decor. Also, new lighting fixtures, designed to increase lighting and reduce kilowatts, were installed. Included in current plans are roofing renovations to reduce heating costs, and installation of suspended acoustical tile ceilings that reduce the volume of air to be heated and provide a dead air space between ceiling and roof that serves as an insulator.

Mercer County Public Schools energy efficiency plan

Management projects and activities currently implemented or planned in Mercer County include:

- complete staff participation;
- an annual punch-list completed by the principal at each building site to correct deficiences and evaluate performance;
- a full-time administrator for the program;
- a curriculum for teaching energy consciousness to students;
- conducting seminars for administrators on energy conservation in conjunction with utility, equipment, and supply companies;
- a training program for maintenance and custodial personnel;
- media recognition;
- periodic investigation and review of rate schedules;
- collection and analysis of utility costs and usage data;
- monitoring of utility meters;
- installation of thermostat controls for heating and cooling;
- purchase of computer-controlled monitoring devices;
- monthly reports to principals about energy conservation;
- cash incentive program for those buildings reducing energy costs.

Board role

What does all this technical information have to do with school boards?

Plenty!

It is the school board that establishes a commitment to efficient energy management through its policies and budget priorities. School board policies will establish the direction and extent of the school system's energy conservation program. And those policies will be reflected in the operating and capital budgets the school board adopts.

Included in school board policy should be a statement of purpose for the energy efficiency program. For example:

- to operate the school system efficiently;
- to use resources where they will have the greatest effect on student learning;
- to educate students about energy conservation;
- to conserve natural resources.

In addition, school board policy should assign accountability for improving energy efficiency, usually to the superintendent. Also, policy on school facilities should ensure that mandated standards are maintained. If the state requires that 70 footcandles of lighting be provided in classrooms, for example, that standard cannot be ignored. Educational specifications used for constructing or renovating school buildings that are approved by the board also should reflect the board's commitment to energy efficiency.

Other policy topics that might reflect such a commitment include:

- funding proposals and applications, purchasing, and borrowing (to enable staff to creatively finance improvements);
- evaluation of support services (to ensure that the school board is kept up-to-date on the value of improvements);
- community use of school facilities and public information program (to ensure that the public is informed of the program's goals and requirements).

Cautions

To be effective, energy efficiency programs require long-range planning. Conducting energy audits for each facility and addressing identified deficiencies need time to accomplish. And don't forget the financial commitment such programs require.

Too expensive for your school system's budget? It may be. But, as Patricia Rose of the U.S. Department of Energy's Institutional Conservations Programs office wrote in *School Business Affairs* (July 1985), "If you don't have it to spend, how do you have it to waste?"

It's important to recognize that energy conservation programs don't always produce savings. Merely holding the line on costs, however, demonstrates efficiency, too. But, remember, savings should not be made at the expense of the comfort, safety, and welfare of the people who use your buildings. ■

For more information

If you want to explore energy conservation measures that may be appropriate for your school system, several organizations have materials on hand that can be useful:

- Association of School Business Officials, 1760 Reston Avenue, Reston, Va. 22090
- Federal Fuel and Energy Office, Public Documents Center, Pueblo, Colo. 81109
- "Making the Most of Your Energy Dollar," U.S. Department of Commerce, Washington, D.C. 20402.